# Is Facial Mimicry Related to Empathy Levels in Children?

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## Background

- Facial mimicry may be involved in a wide array of socioemotional skills, including empathy.
- Most facial mimicry is thought to be covert and detectable only by using specific electromyographic (EMG) measurements of the muscles generating these expressions.
- We planned to investigate the presence of facial mimicry and its relationship with empathy in children.

### Goals of the current study:

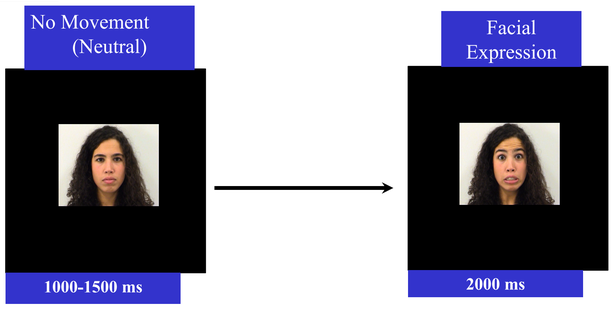
1. **Confirmed that our EEG electrodes yielded the expected pattern of muscle activity while the participants *performed* fearful and happy facial expressions.**
2. **Tested whether or not the same pattern of muscle activity was present while participants *observed* others' facial expressions.**
3. **Related the muscle activity during observation to caregiver reports of empathy**

## Method

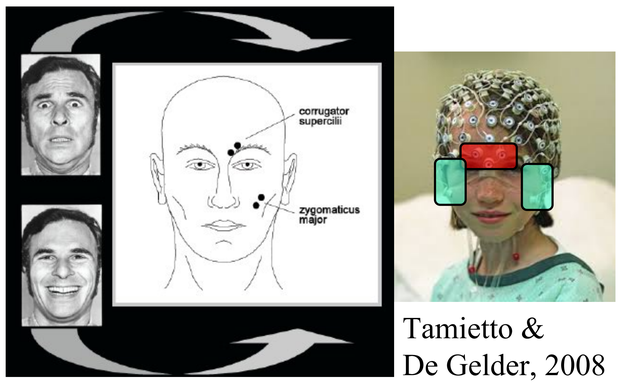
### Participants

- 53 children (29 females, 24 males)

### Task




*Time interval of fear face that was observed*

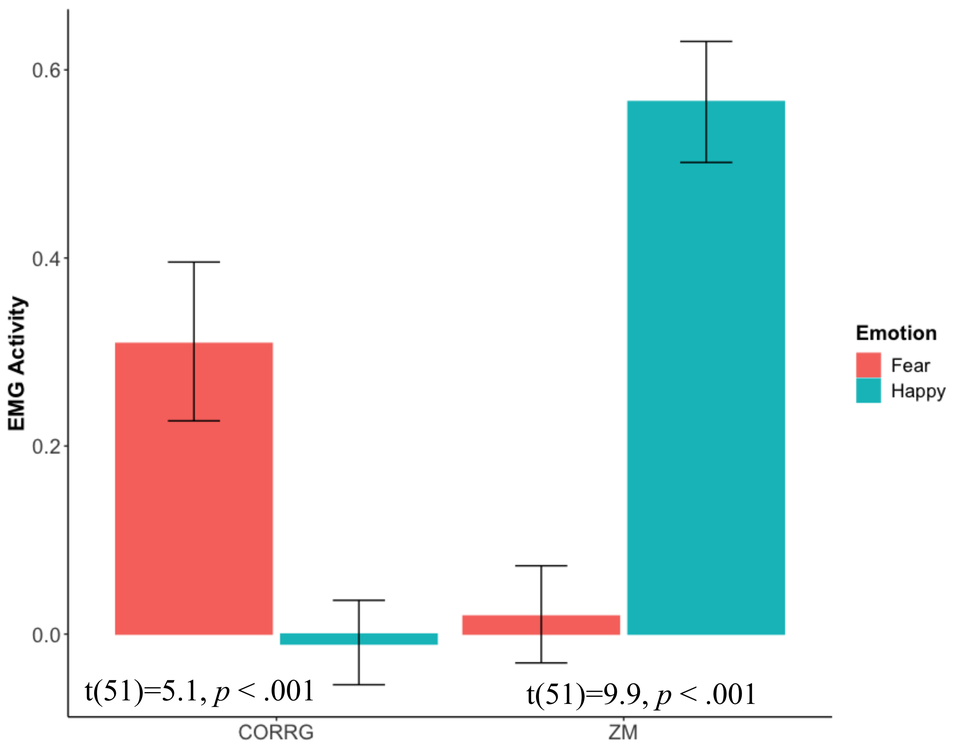



Tamietto & De Gelder, 2008

*EEG electrode clusters used to measure Zygomaticus major and Corrugator supercilii activity*

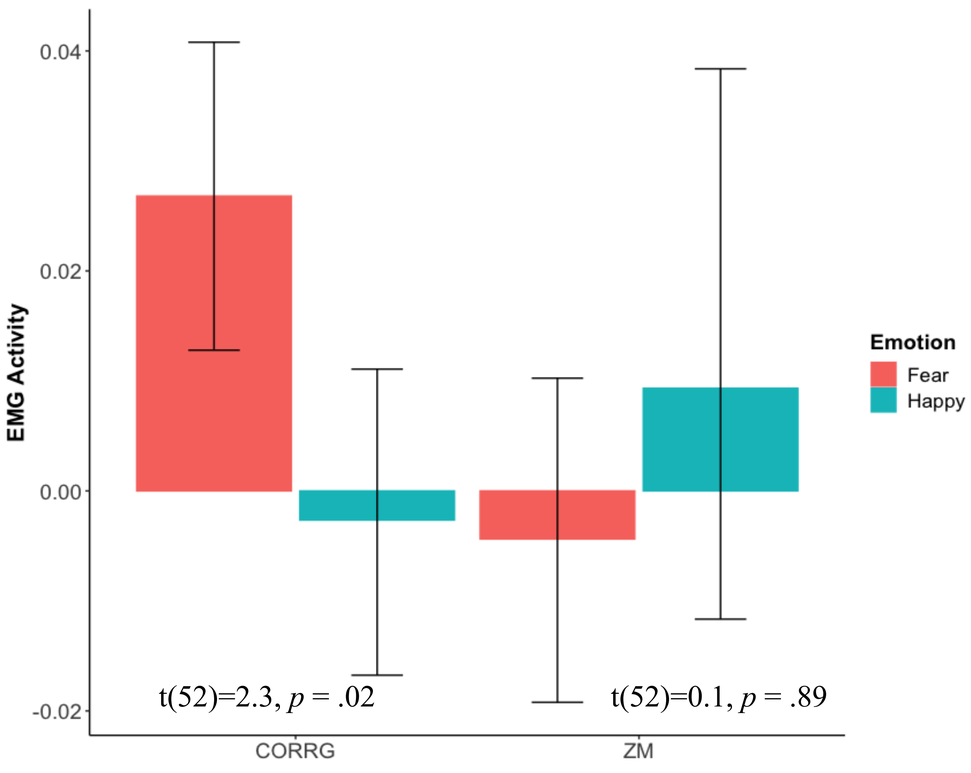
## Results

### Facial Movement During *Execution* of Fearful and Happy Faces




Interaction, $p < .001$

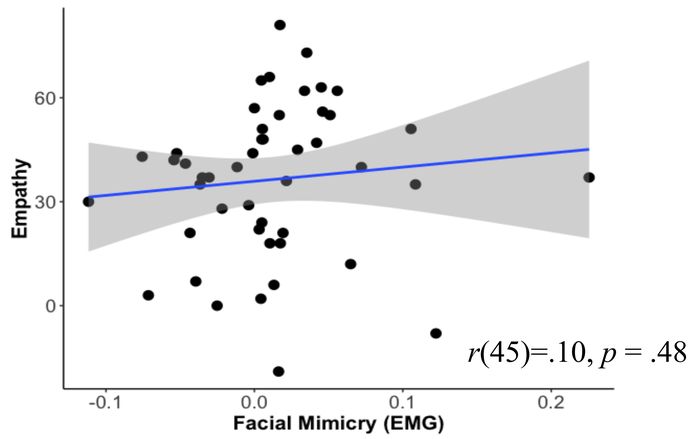
### Facial Mimicry During *Observation* of Fearful and Happy Faces



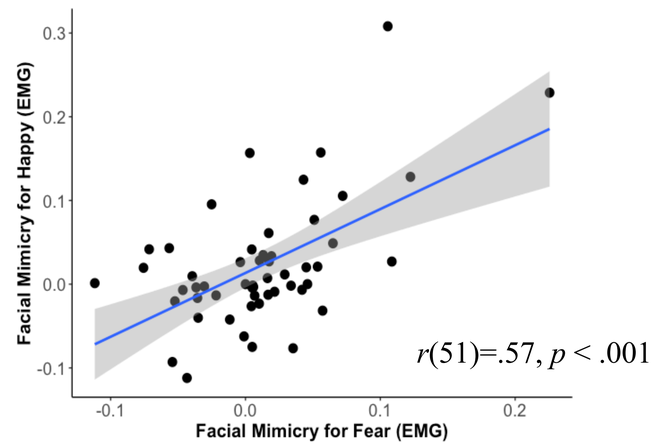

Interaction, $p = .04$

## Results

### No Correlation Was Found between Facial Mimicry and Empathy




### Correlation Was Found between Facial Mimicry of Happy and Fearful Expressions




## Summary of Findings

- The findings suggests that the EEG electrodes were able to capture and differentiate between the execution of happy and scared faces, thus confirming that EEG electrodes can pick up muscle movements signals similar to that of EMG
- We also found evidence for facial mimicry, specifically in the Corrugator supercilii cluster when participants observed a scared face
- No correlation was found between levels of facial mimicry and empathy levels
- Additionally, we found a correlation between facial mimicry across the 2 conditions; those who tended to exhibit facial mimicry for fear expressions also tended to mimic happy expressions as well

## Acknowledgements

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